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Galvanomagnetic and thermomagnetic properties of $AgSbTe_2$[1]
VLADIMIR JOVOVIC, JOSEPH HEREMANS, The Ohio State University — We report here data on the electrical resistivity, magnetoresistance, Hall effect, thermoelectric power, magneto-Seebeck and transverse Nernst-Ettingshausen coefficients of high-quality crystals of $AgSbTe_2$, measured from 77 to 400 K in magnetic fields up to 2 Tesla. Thermal conductivity data are also reported in samples with a much higher carrier concentration than those used in our other work.[1] From an analysis of these data, we conclude $AgSbTe_2$ to be a very narrow-gap semiconductor ($E_g \approx$ 7.6±3 meV) with ∼5x10^{19} cm^{-3} holes in a valence band with a high density of states and thermally excited ∼10^{17} cm^{-3} high-mobility (2,200 cm^2/Vs) electrons at 300 K. The estimated hole density-of-states effective masses, including Fermi pocket degeneracy, is 2.5±0.5 free electron masses; the electron mass is about two orders of magnitude smaller, but the exact value cannot be resolved. The lattice term dominates the thermal conductivity, [1] and the electronic contribution in samples with both electrons and holes present is in turn dominated the ambipolar term. The low thermal conductivity and very large hole mass of $AgSbTe_2$ make it a most promising p-type thermoelectric material. [1] Lattice thermal conductivity of $AgSbTe_2$, D. T. Morelli, V. Jovovic, S. J. Tiagarajan, and J. P. Heremans, Abstract reported here.

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